

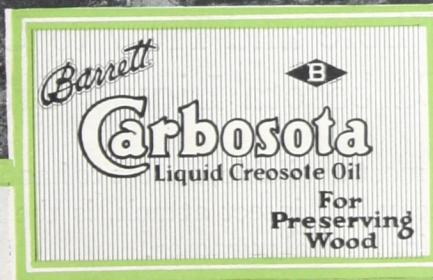
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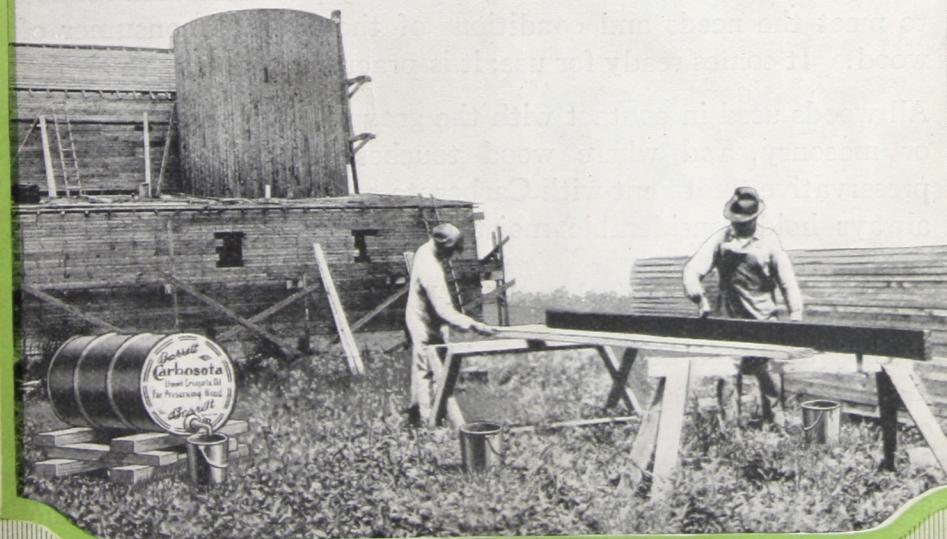
MAR 2 1921

THE FRANKLIN INSTITUTE

Long Life for Wood



Open Tank process:
Carbosoting posts
grown on farm
woodlot.



Surface Treatment:
Applying two brush
coats of Carbosota.



Pair of double wall silos (18 feet diameter, 30 feet high). Built of yard stock treated with Carbosota Liquid Creosote Oil previous to erection. (Barn stained with Carbosota and trimmed in white)

Where and How to Use Barrett Carbosota Liquid Creosote Oil

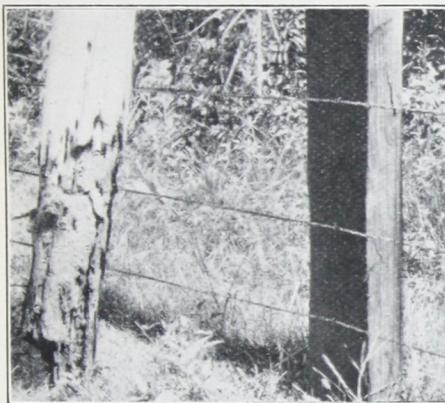
WOOD is the most available, easiest to handle and, protected against decay and insect attack, is the most economical building material for general purposes.

Carbosota Liquid Creosote Oil preserves wood against decay. It is pure, coal-tar creosote oil, especially processed and refined to meet the needs and conditions of the average consumer of wood. It comes ready for use; it is practical and easy to apply.

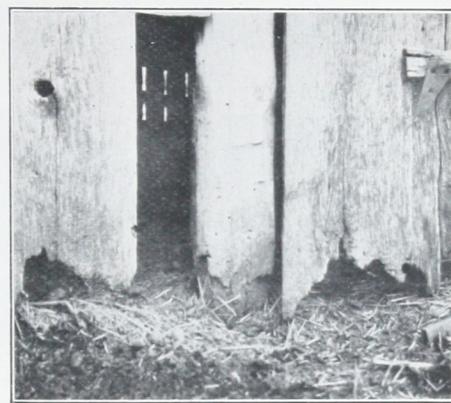
All woods used in contact with the ground, with concrete, brick or masonry, and where wood touches wood, should receive preservative treatment with Carbosota as these points of contact always hold considerable moisture.

Buildings that Need this Protection

Carbosota should be applied to sills, joists, stringers, and planking, wherever these are exposed to decay, whether in dwellings, commercial structures, or farm out-buildings, and to stalls, feed alleys and the flooring of barns. Likewise the underside and tongue and grooved edges of porch flooring and steps, and



Decayed untreated cedar fence post. Replaced by creosoted yellow pine post of 3x6 inch lumber



Destruction of vertical barn siding by decay and rotted post

practically all lumber used in corncribs, granaries, potato houses, ice houses, hot beds, grape arbors, pergolas, sidewalks, wash-line posts, small piers and boat landings at summer resorts, board walks, rustic type bridges and shelters in parks and a multitude of other outdoor wooden structures, should be protected from decay with Carbosota treatment.

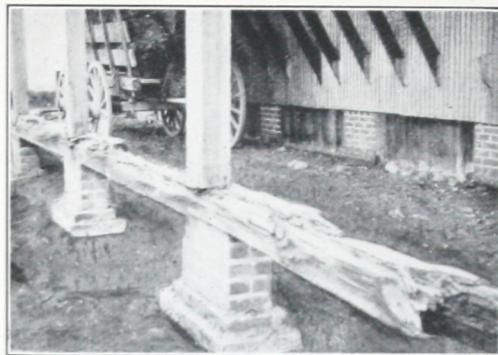
Animal Shelters

Stables, stalls, corrals, dog kennels, hog houses, sheep sheds, poultry houses, hog feeders, forage racks, shelters in Zoological gardens should be preserved by treatment with Carbosota. Wagon bottoms, manure spreaders and similar miscellaneous equipment can also be treated to advantage. The treatment not only protects lumber from decay, but also aids in keeping the buildings and wooden parts sanitary and free from insects, vermin, chicken mites, blue bugs and many of the disease germs so deadly to poultry and livestock. Carbosoted wood also repels rodents.

WHITE ANTS—In many districts white ants (termites), have proved



Decay of sills and corner post of barn which resulted in serious sagging of entire structure



Destruction of sills and posts of cotton gin by combination of white ants and decay

a serious menace to structural woods. Frequently, the destruction of lumber by these insects is even more rapid than by decay. This matter has been investigated by the United States Department of Agriculture, and Farmers' Bulletin No. 1037 strongly recommends treatment with creosote oil, stating—

"Where stone or concrete foundations are impracticable, use timber impregnated with coal-tar creosote." Carbosota is especially suited to this work.

Silos and Their Protection

Creosoted wooden silos are considered the most economical and efficient. They are the cheapest per year of service.

For home treatment of silos the Open Tank process should be used wherever possible. If conditions make this impossible, the Brush treatment should by all means be used, and especial care taken that at least two coats of Carbosota are applied to the top, bottom, tongue and groove edges of staves before erection. Carbosota can be applied to the interior after erection and the exterior stained with Carbosota or painted as desired.

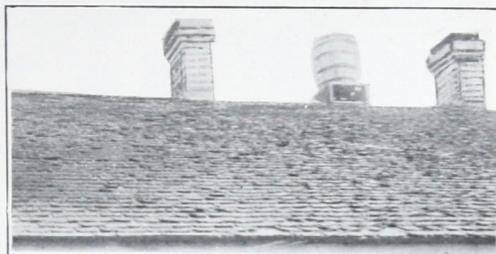
Carbosoted lumber, and interior walls of silos when treated after erection should be permitted to dry thoroughly before using or filling the silo. Preservative treatment, when properly applied with Carbosota, in no way affects the ensilage.



Creosoting silo lumber on farm by dipping

Shingle Preservation

The treatment of wooden shingles with Carbosota retards their decay, lessens warping and shrinking. It also imparts a pleasing dark brown color to the wood.



Shingle roof (pine) after a few years service badly decayed, curling and warped out of shape

The cheaper grades of wooden shingles when creosoted with Carbosota, will give better service than untreated shingles of the most expensive grades.

Fence-Posts

Fence posts decay rapidly, some of the most durable having an average life of only about 10 years. These can be made to last 30 years and the less durable varieties, which have a natural life of but 3 to 5 years, will serve 20 years, if properly carbosoted.

The cost of treatment is sufficiently low to assure a big saving, varying between 30% and 50% in the case of the non-durable varieties of posts and somewhat less on the so-called durable woods such as cedar, chestnut, etc.



Fruiting body of fungus appearing early on cypress post of the South

Carbosoted sap-pine, cottonwood, ash, beech, birch, and similar species grown on farm wood lots are more than 50% cheaper per year of service than the same posts untreated, and over 20% lower in annual cost than untreated cedar.

Durable woods, such as cedar and chestnut, require treatment of the butt end only, that portion extending from



Decayed sill resting on concrete foundation pier, likewise gate post infected from sill and partially rotted.

6 inches above the future ground line to and including the bottom end. Treatment recommended for such species, is the Open Tank process (hot and cooling treatment). This consists of immersion of the butts of the posts in bath of heated Carbosota (175° to 200° F.) for 4 to 6 hours, thereafter cooling to atmospheric temperature, minimum 50° F., posts to remain immersed during the entire treatment. This is best accomplished by applying the hot treatment early in the morning and withdrawing heat after the required hot period, utilizing the balance of the day for the required cold treatment, or during favorable weather applying hot treatment in the evening and permitting the posts to cool over night.

Non-durable species, such as ash, basswood, butternut, beech, birch, cottonwood, elm, sap or second growth cypress, gum, hickory, red oak, maple, sap yellow pine, Western pines, sycamores, willow, etc., should be treated their entire length, but require a heavy absorption in the butt end only.

Treatment should consist of immersion of the butt end of posts in the bath of hot Carbosota for about one hour, followed by immersion of the whole post in a bath of cold Carbosota for 30 minutes. The simple plant needed is illustrated at the top of page 7.

To assure successful treatment, the posts, whatever the species, must be peeled clean of all bark, and also of the fine inner skin or bark that sometimes adheres after peeling, and must be seasoned air-dry before treatment. In some sections of the country seasoning is accomplished in 60 days; in other localities it may take 6 months or longer. Detailed information about this can be obtained from the County Agricultural Agent, or State Agricultural College, or by addressing our nearest office.

Home-Made Treating Plants



Farmer's home-made treating plant for non-durable posts



Butt treating cedar posts—hot and cooling process. After treatment posts were placed in small drum to drain

Carbosota Open Tank Prod

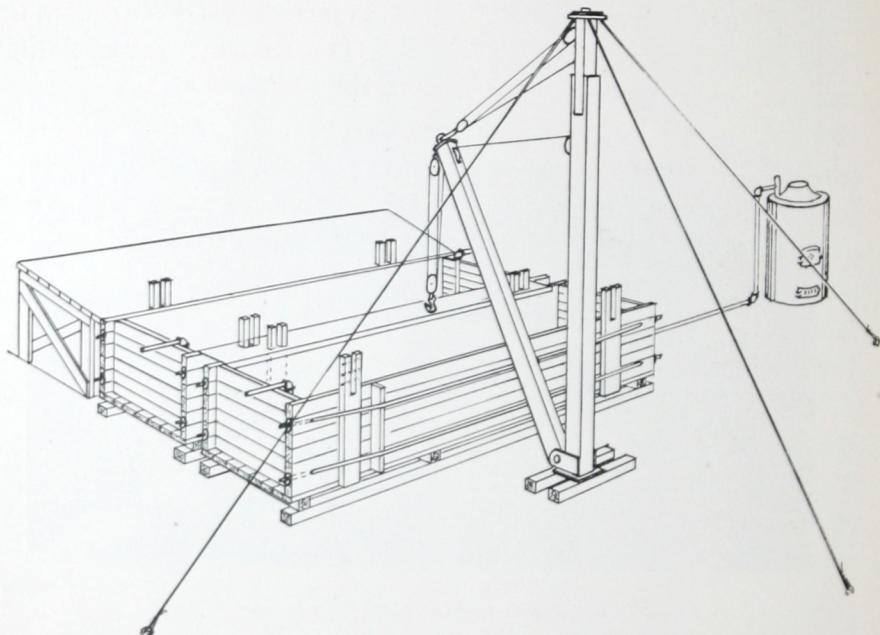
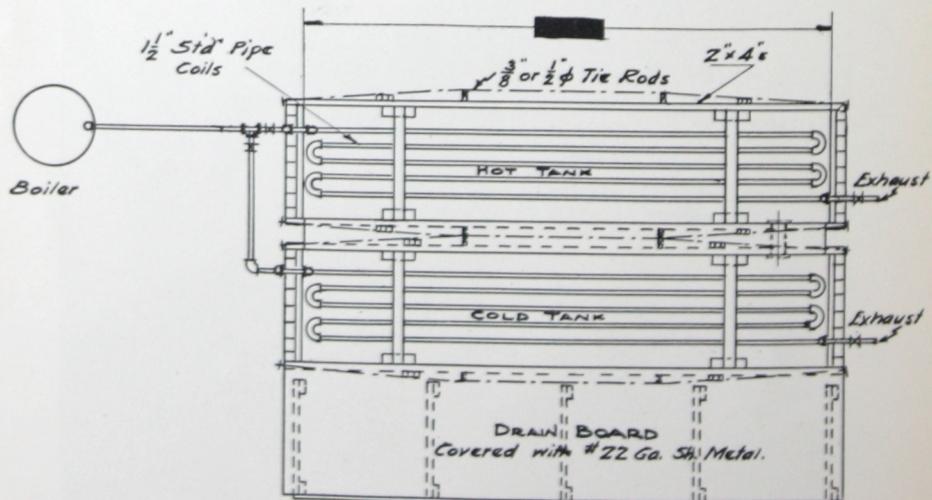


Figure A



PLAN
Plan of Figure A

Process Creosoting Plants

Figures A and B illustrate simple types of carbosoting plants. The principal features of both are (1) treating tanks built of 2-inch or 3-inch rough lumber reinforced by proper bracing, lined with sheet iron, lapped and soldered at joints to insure against leakage; (2) steam coils for heating Carbosota of 1-inch or $1\frac{1}{2}$ -inch W. I. pipe, arranged to avoid condensation; (3) draining board to allow drippings from treated lumber to drain into treating tank; (4) hoisting apparatus, such as derrick, chain block, etc., to charge and unload treating tanks; (5) means of forcibly submerging timber in Carbosota; (6) small 5 to 15 H. P. boiler in case live steam for heating is not otherwise available. Type A is quite suitable for temporary work, small dealers' plant or for a farmer's community plant. Type B is designed for somewhat greater capacity, and for contractors.

Detailed working plans for tanks and bracing are available. Request No. A2488 for Type A and A2489 for Type B.

It must be recognized that standard equipment for the Open Tank process is an impossibility as one of the chief advantages of this method is its ready adaptability to almost any condition. However, the types shown herewith indicate the simplicity of the general equipment suitable and wide range of adaptability.

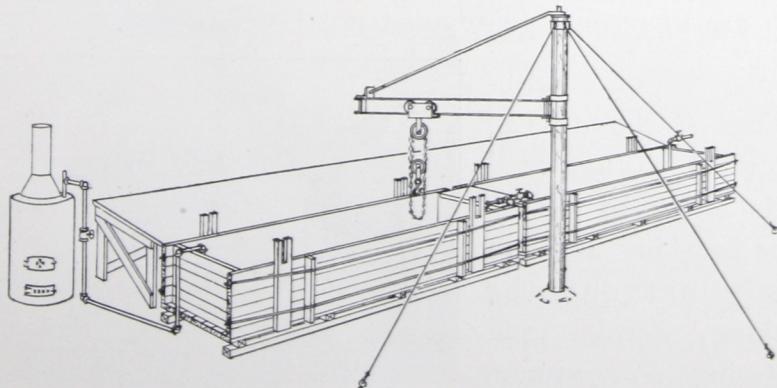


Figure B



Miners' cottages, mill workers' homes and tenants' dwellings are attractively and economically stained with Carbosota



Bungalows with wide rough siding are most attractively stained with Carbosota especially when trimmed in white, at a cost of less than one-third that of painting

Tree-surgery

Creosote Oil is recommended by the U. S. Bureau of Plant Industry for use in tree surgery (Farm Bulletin No. 1178). Carbosota is particularly adapted for this purpose when carefully applied by experienced tree surgeons.

As a Stain

Carbosota is superior to ordinary stains for many purposes, since it is more permanent, checks decay and has distinct insecticidal and germicidal qualities. Carbosota thoroughly impregnates the surface, staining the wood a brown varying in shade with the density and character of the lumber.

Surfaces which have been stained with Carbosota cannot without special treatment, be covered with ordinary paint. Therefore, such parts as the sashes, door-frames, trim, etc., which are to receive paint must not be creosoted.

For barns and other farm-buildings Carbosota can be applied to unplanned boards either by spraying or brushing and will largely prevent the shrinking, warping and splintering so common with cheap lumber.



Exceptionally artistic effect which resulted from the use of Carbosota Creosote Oil as a stain

Miscellaneous Uses

In addition to the more common uses on farm and plantation, Carbosota offers numerous opportunities for profitable employment on wooden flumes and stave pipe construction in connection with irrigation projects and mine development; in stockyards, for the treatment of cattle pen posts and fencing; by railroads for the thousands of small cattle loading yards and platforms distributed along the right of way; for highway guard rails and posts; mile posts and road markers for the State highways; small culverts for country roads; highway bridge planking and flooring, particularly when this is given additional protection by a Tarvia wearing surface; timber construction for playgrounds, baseball parks, athletic fields, race tracks and State Fair Grounds, and numerous other places which would require too much space to enumerate.



Decayed culverts in country road, representing both waste and danger

The Application of Barrett Carbosota Liquid Creosote Oil



Decayed post of cattle pen in stock yards

The wood must be thoroughly seasoned. Oil cannot well enter the wood while it is filled with sap or water. This must first be driven out which is usually best accomplished by air seasoning. In exceptional cases, and with particularly suitable species and grades of wood, the Open Tank process has been successfully employed with practically green wood. Such work, however, must be conducted under experts' supervision and where a problem of this nature



Surface treatments (two or more brush coats of Carbosota) at points of contact

presents itself the services of our technical division should be enlisted.

Recommendations for Non-Pressure Treatments

Open Tank Process

Impregnation of wood with Carbosota Liquid Creosote Oil in open tanks or vats, without artificial means other than heat, by aid of

atmospheric pressure, gravity of the preservative and expansion and contraction of air and moisture in the wood cells caused by the difference in temperature between the hot and cold or hot and cooling treatments. The process is divided into (1) the hot treatment and (2) the cold treatment, or (a) the cooling treatment.

1. The hot treatment consists of submerging the wood for varying periods in Carbosota Liquid Creosote Oil which should be maintained at a temperature of between 175° and 200° F.

2. The cold treatment immediately follows the hot treatment and consists of submerging the wood for varying periods in Carbosota Liquid Creosote Oil, which should be maintained at atmospheric temperature, between the minimum and maximum limits of 50° and 100° F. (a) In place of the separate cold treatment the wood may be cooled in the oil as follows: Upon expiration of hot treatment, wood is not removed but remains submerged in Carbosota, heat is shut off, and both wood and preservative permitted to cool to atmospheric temperature, within minimum and maximum limits of 50° and 100° F.

Wood of species that readily absorbs creosote, and of small cross-section, often is adequately impregnated by the hot treatment only. In that event, the Dipping Method becomes a modification of the Open Tank Process, and should be conducted as described under Surface Treatments.

The quantity of Carbosota required varies with the dimensions of the lumber to be carbosoted, between 10 gallons per thousand feet B. M. for 12 by 12 inch timber and 60 gallons per thousand feet B. M. for 1 by 4 inch boards. Therefore it is suggested that full detailed descrip-

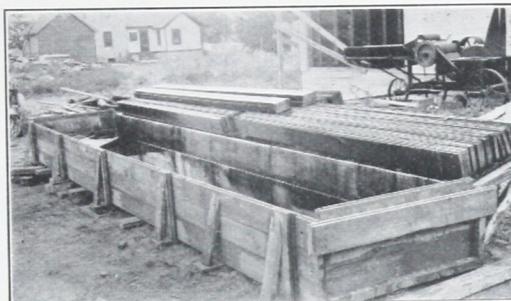
tion of the type and character of construction, and bills of material, giving the cross sections, species, grades, and quantity of lumber to be treated be sent to our nearest office, which will gladly provide recommendations for treatment and furnish an estimate as to the quantity of Carbosota that will be needed. Address nearest office.

Surface Treatments

This description applies to any practical method of preservative treatment which coats the surface of the wood and surrounds it with an intact film of the preservative. They are distinctive from the regular creosoting processes, namely pressure processes, or the Open Tank process which aims to secure a thorough impregnation. The principal methods that have become standard practice are:

(1) *Brush Treatment.* Application of two paint coats of Carbosota with a wide wire-bound brush. The oil should be carefully brushed into all crevices and checks, depressions and abrasions. Poles and large timbers are often treated by applying the preservative with a mop or by pouring it over the wood.

(2) *Spraying.* Application of Carbosota with spraying machines, operated by compressed air or hand pumps. Two applications are usually advisable. This method has advantages over the brush treatment, as less labor is required and the preservative can be more readily forced into checks, crevices,



Wooden tank lined with sheet iron. Built by farmer for the treatment of silo lumber

bolt holes, etc. Spraying machines must be equipped with properly designed nozzles and suitable hose.

(3) *Dipping.* Complete immersion of timbers in Carbosota for short periods. As this method requires but one operation it is economical and practical where tanks, mechanical means of handling timber and steam for heating oil can be provided. When employed for treating wood of species readily impregnated this method becomes a modification of the Open Tank process.

The preservative should be heated to an average temperature of 150° F. for brush and spraying treatments, and should be maintained at a temperature of between 175° and 200° F. in the dipping treatment.*

Lumber and timber should be cut to size, bolt holes drilled, and completely framed previous to treatment, and protected against abrasion after treatment. If the treated surfaces are injured and the film of preservative broken, exposing untreated wood to attack by fungi, such abrasions should receive an additional treatment of two coats of Carbosota.

The quantity of Carbosota required for Surface treatments is approximately as follows: Brush treatment (2 brush coats) one gallon per 100 square feet of surface; spraying (two applications), one and one-half gallons per 100 square feet of surface; dipping (immersion for from 5 to 15 minutes), one to one and one-half gallons per 100 square feet of surface.



Wagon-bottoms quickly fail due to decay; carbosoted they will last long and still look well

*NOTE—Carbosota, because of its special physical fitness, flows freely at 41° F. (5° C.), and, therefore, exception is allowed when circumstances absolutely preclude heating the oil, but satisfactory results are obtained only when the mean atmospheric temperature is not lower than 60° F.

Suggestions

Lumber should be treated by the Open Tank process wherever the amount of work warrants the slight expense for tanks and heating equipment.

For general purposes Surface treatments are always available. They are the most practical for the average consumer, as he can readily treat one or a thousand pieces.

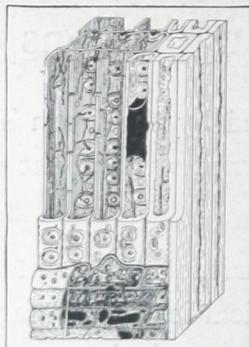
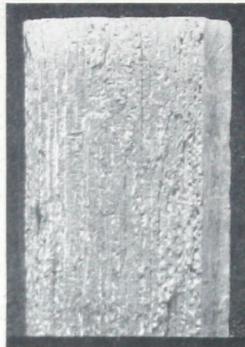
Where it is necessary to frame timbers after they have been treated, all surfaces so exposed should be given a liberal Brush treatment before placing them in service.

CAUTION. Great care should be taken in employing Carbosota for greenhouse lumber and it should be used only after thorough study of the possible effect upon contents. Where cautiously used beneficial results have resulted, but no recommendations are here made and it is suggested that each case be considered individually.

Wood to be treated by the Open Tank Process should be thoroughly air-seasoned or air-dry, that is, the moisture content should not exceed 20% of the average oven-dry weight of the respective species.

Timber and Lumber should be framed, all mortises and tenons cut, bolt holes drilled, and otherwise completely manufactured, ready for placing, previous to treatment. If abrasions of the treated surfaces occur, or additional framing or drilling become necessary after treatment, a two brush coat application of Carbosota at such points is imperative.

Technical service, detailed recommendations, etc., for application of wood preservation obtainable gratis by addressing nearest office. If there is a question about how to use Carbosota, write and ask—don't guess.



Decay illustrated: At left an ordinary block of wood honeycombed by wood destroying fungus as seen by the eye; at right, a magnified photograph of fungal threads penetrating the wood cells. In centre, a drawing of a block of wood, greatly magnified, illustrating the progress of decay. First only small holes appear in the cell walls, due to the penetration of the threads (hyphae) of the fungus. Then as the dissolving action proceeds further, the cell walls are gradually "broken down" until destruction is completed. (Photographs and drawing supplied by the Dept. of Wood Technology, N. Y. State College of Forestry.)

Why Lumber Rots

Shorn of technical phraseology, wood decay is simply the destruction of the wood by plant organisms, or fungi. These grow from microscopic spores—seeds—whose roots permeate the wood structure, penetrating and “breaking down” the cell walls.

In their fruiting stage, these fungi take the form of moulds, masses of fine cotton-like threads, or mushroom growths varying in shape and color. A single one may throw off billions of spores which lodge on new timber. If conditions are favorable, these spores germinate

and thus continue indefinitely the cycle of decay.

While wood decay is prevalent practically everywhere, the rapidity with which it develops varies with the climate and the species of wood attacked. Its progress also depends upon air, moisture, and warmth. Whenever wood comes in contact with the ground, masonry, concrete, or other wood, decay quickly develops and the timber at these points of contact usually has to be replaced long before the rest of the structure has been materially affected.

(From full page advertisement on "Wood Preservation" in the Saturday Evening Post)

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